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10/532521



INVESTOR IN PEOPLE

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PCT

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

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Signed

Dated 23 February 2004

Patents Form 1/77

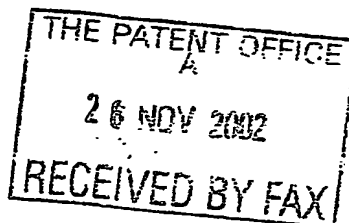
Patents Act 1977
(Rule 16)

The
Patent
Office

26NOV02 E766343-1 C04074
P01/7700 3-00-0227518-8

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form.)



The Patent Office

Cardiff Road
Newport
Gwent NP9 1RH

1. Your reference

OPBEN

2. Patent application number

(The Patent Office will fill in this part)

0227518.8

26 NOV 2002

3. Full name, address and postcode of the or of each applicant (underline all surnames)

WILLIAM ANTHONY DENNE

THE LANE HOUSE

108 CHURCH STREET

CANTERBURY

3284562001

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

CAMBRIDGE CB2 3EL

4. Title of the invention

JET INJECTION NOZZLE

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

AS IN 3 ABOVE

Patents ADP number (if you know it)

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)Date of filing
(day / month / year)

N/A

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

N/A

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

NO

a) any applicant named in part 3 is not an inventor, or

b) there is an inventor who is not named as an applicant, or

c) any named applicant is a corporate body.

See note (d)).

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description

Claim(s)

Abstract

Drawing(s)

0

2 ✓

0

1 ✓

3 ✓

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents
(Please specify)

11.

I/WE request the grant of a patent on the basis of this application.

Signature

N. A. Penn

Date 26 NOV 02

12. Name and daytime telephone number of person to contact in the United Kingdom

01223 826191

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 23 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

- If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505.
- Write your answers in capital letters using black ink or you may type them.
- If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- If you have answered 'Yes' Patents Form 7/77 will need to be filed.
- Once you have filled in the form you must remember to sign and date it.
- For details of the fee and ways to pay please contact the Patent Office.

JET INJECTOR NOZZLE

Patents PCT/GB02/02633 describes a jet injector in which a fast droplet cuts a track through the skin and the dose is delivered manually via a piston and cylinder down this track. For this to happen, it is necessary for the entrance of the track to be held open.

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According to the present invention there is a concave surface surrounding a jet injector nozzle such that pressure of the concave surface against the skin places the skin beneath the nozzle under tension, so that the entrance to a track cut through the skin by a jet from the nozzle is held open. The concave surface may be such that the skin distending into it does not fill the full volume. The surface immediately surrounding the jet nozzle may be convex in relation to the concave surface, so that the nozzle preferentially seals against the skin.

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The jet in injector described in PCT/GB02/02633 relies on the entrance to the track through the skin being held in register with the nozzle and being held open. In addition, a high pressure hydraulic seal around the nozzle must be maintained to prevent wet shots.

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Figure 1, 2 and 3 show sections through the axis, 30, of a cylindrical symmetry which lies through the jet nozzle, 31. In figure 1, the jet injector nozzle assembly, 1, is pressed against the skin of the patient, 2, and a concave surface, 3, causes the skin to distend into the concavity. This distension creates tension in the skin surface, 4, which causes the entrance, 5, to the track, 19, cut through the skin by the jet, to remain open. The periphery of the concave surface, 6, provides a high pressure hydraulic seal. However, such an arrangement leaves an air bubble, 7, between the

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JET INJECTOR NOZZLE

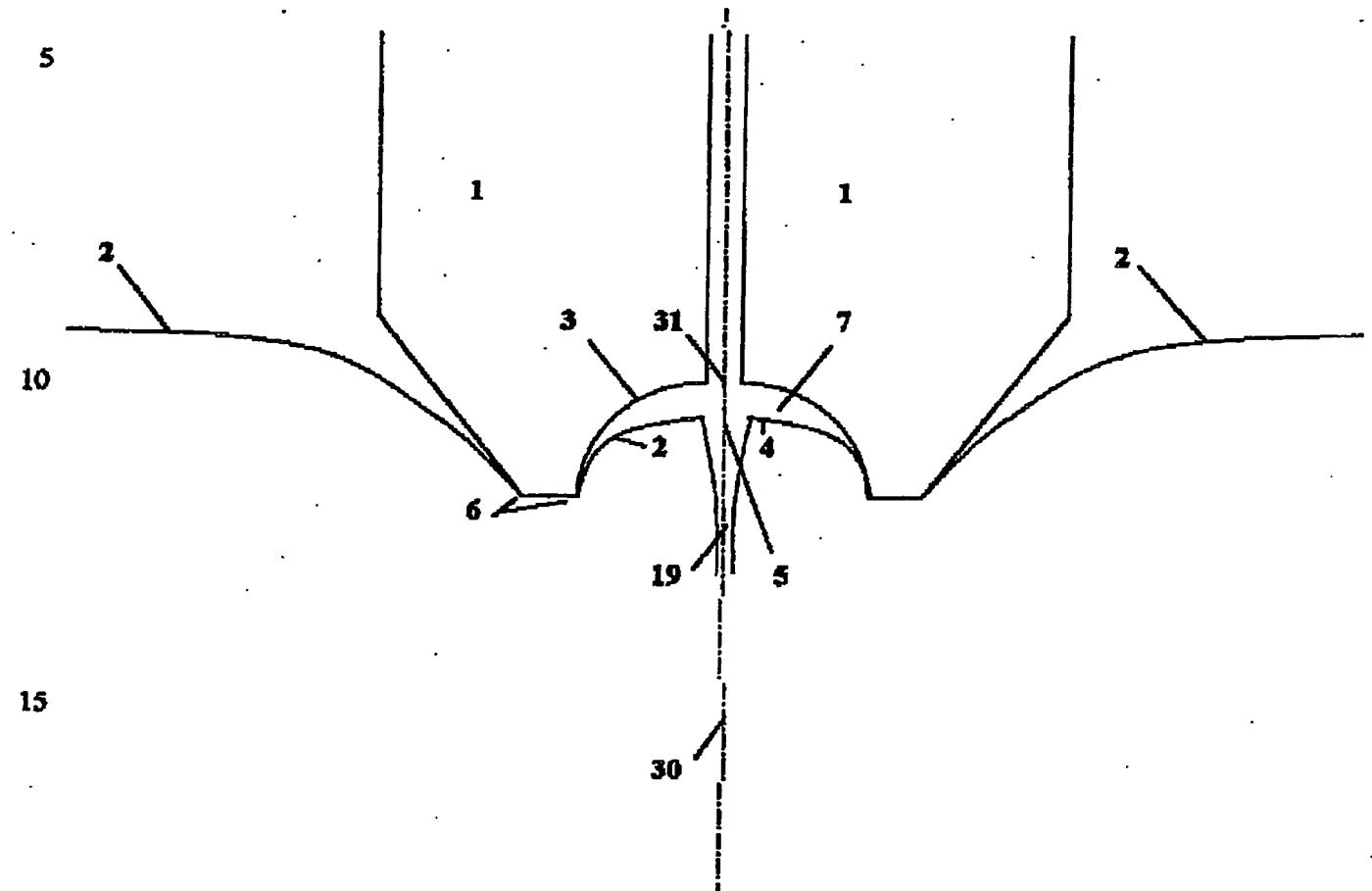
nozzle and the skin. While the volume will be small, injection may still entrain the air and deposit it subcutaneously which is undesirable.

This problem is resolved in figure 2, in which the distended skin seals against the
5 nozzle, 10, so isolating the trapped air in the periphery of the concavity, 11.

The situation is taken a step further in figure 3, in which the nozzle is convex with respect to the concave surface, 12, so positively locating against the skin and maintaining the nozzle - track alignment.

JET INJECTOR NOZZLE**Abstract**

A jet injector is described in PCT/GB02/02633 in which a single fast droplet cuts a
5 track through the skin and the dose is delivered manually via a piston and cylinder. In
this patent, a concave surface surrounding the jet nozzle is described which holds the
track entrance open by creating tension in the skin surface.

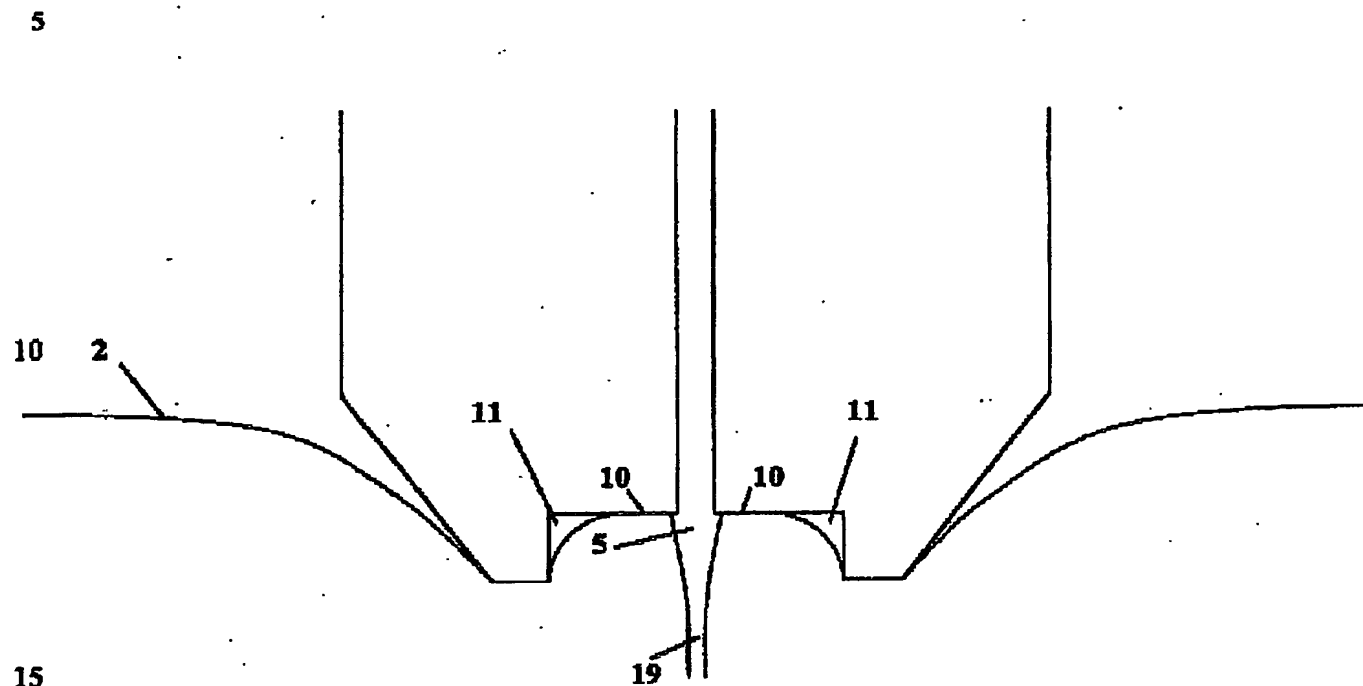
JET INJECTOR NOZZLE**Figure 1**

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JET INJECTOR NOZZLE

Figure 2

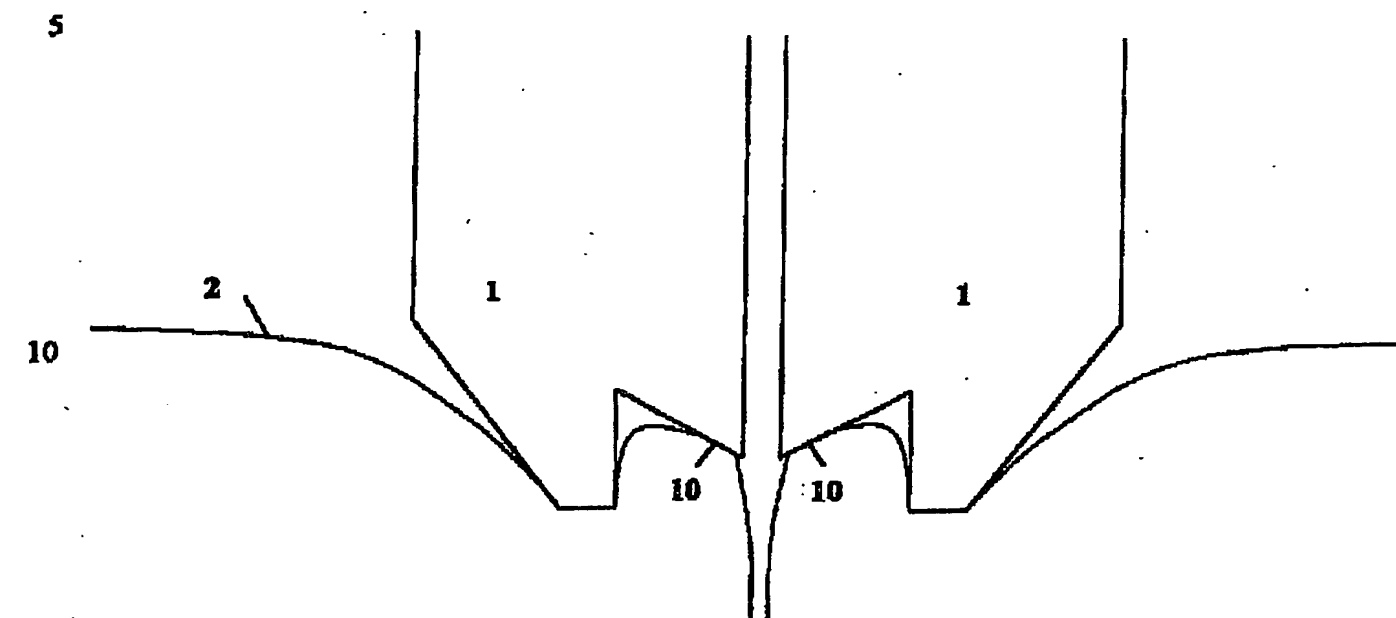


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JET INJECTOR NOZZLE

Figure 3



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PCT Application
GB0304706

